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BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 10/612,658
Filing Date: July 02, 2003
Appellant(s): GALLIGAN ET AL.

Scott S. Servilla
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 11, 2008 appealing from the Office action mailed July 14, 2009.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The following are the related appeals, interferences, and judicial proceedings known to the examiner which may be related to, directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal:

Board's decision on related application 10/376,836 (filing date 2/28/2003), (Appeal 2007-1178, decided: May 21, 2007).

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

4,455,281	Ishida et al	7-1984
4,798,770	Donomoto	1-1989
6,042,879	Draghi et al	3-2000
5,204,302	Gorynin et al	4-1993
4,027,367	Rondeau	6-1977
EP 0 831 211	Uchida et al	3-1998
5,713,906	Grothues-Spork et al	2-1998
6,221,075	Tormala et al	4-2001
2001/0006008	Dean et al	7-2001

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-3, 5-6, 31-34,37-38, 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida et al (4,455,281) in view of EP 0 831 211 (to Uchida et al).

Ishida '281 discloses a method of producing a plate-shaped catalyst unit for NO_x reduction of exhaust gas wherein the catalytic substance if prevented from falling off (note column 2, lines 17-10).

The catalyst unit is produced by a method comprising the steps of spraying molten metal upon the surfaces of a metal plate to allow the molten metal to accumulate thereon to form rough surfaces and depositing a catalyst containing titanium and at least another catalytic material for NO_x reduction of exhaust gas onto said rough surfaces whereby the catalyst is firmly secured on said rough surfaces (note claim 1). Ishida '281 further discloses that forming the surfaces of the metal plate into rough surfaces is effected by molten metal spraying. In the typical case, a metal wire is heated to be molten by contact resistance of electricity, an electric arc or high temperature flames, and molten metal thus obtained are sprayed together with gas such as compressed air through nozzles on the surfaces of the metal plate in the forms of very small droplets of molten metal allowing the molten metal to solidly secured thereto. As the molten metal sprayed, the same type of material as the metal plate is preferred. Then a catalytic substance is attached onto the surfaces of the metal plate formed into rough surfaces by the molten metal spraying (note column 4, line 62 to column 5, lines 13). As shown in Figure 17, a metallized layer where small metallic particles 8 are piled up are formed on the metal plate (note column 5, line 63 to column 6, line 6). The

"metallized layer", comprises the particles 8 to form the rough surfaces, is considered as the claimed anchor layer.

Thus, Ishida '281 fairly teaches that the formation of the rough surfaces by electric arc process, would facilitate the bonding between the catalytic substance and the metal carrier.

The metal plate can be thin steel plates, such as ASTM type 430, type 410 and type 304 (note column 4, lines 53-61). Ishida '281 also discloses that a metal wire mesh can be used instead of metal plate (note column 1, lines 55-58). Moreover, the metal plate can be subjected to bending work as shown in Figures 3-4, when those bent plates are piled up, bent portions hold spaces there between, whereby spacers which would otherwise be necessary can be saved, resulting in increased catalytic area (note column 3, lines 61-68). The shapes shown in Figures 3-4 are considered as having "accordion pleats" or "corrugated" structure. The metal plate in Ishida '281 can also be perforated metal plate (note Figures 7-9).

Since the metal plate in Ishida '281 can be bent, one skilled in the art would be able to use such metal plate to form a conformable catalyst member as required in the instant claims.

For the limitations "to be mounted…an open discharge end", "when the conformable catalyst member is bent…", or "for treating noxious components of engine exhaust gas", they are considered as an intended use and regarding such the intended use limitation, it is noted that this is merely a recitation of the intended use of the claimed catalyst body, and that the claimed catalyst body does not depend on the

intended use for completeness, but instead the limitations of the catalyst body are able to stand alone; see MPEP. 2111.02 and 2114. Also, it is well settled that terms merely setting forth intended use for, or a properly inherent in, an otherwise old composition do not differentiate the claimed composition from those disclosed in the prior art. *In re Pearson 181 USPQ 641* and it is contrary to spirit and patent laws that patents be granted for old compositions of matter based on new uses of compositions where uses consists merely in employment of compositions; patentee is entitled to every use of which invention is susceptible, whether such use be known or unknown to him. *In re Thuau, 57 USPQ 324.*

The difference is Ishida '281 does not disclose that a tube of corrugated construction.

Uchida '211 discloses an exhaust emission control device for internal combustion engines (note column 1, lines 11-19). Such device can have a catalytic metal bearing member that can be a hollow cylinder (i.e., tube), which is made of a porous metal sheet, (note Figures 12-13 and column 11, lines 39-42) or a corrugated porous plate (note Figure 16D). The metal sheet or plate is considered as the support or carrier for the catalytic material. Uchida '211 further discloses that the "steel sheet" bearing catalytic metal should be understood as not being limited to the construction described in relation to various embodiments and modifications and also as not being limited to the porous sheet (note column 14, lines 17-22). Thus, Uchida '211 fairly suggests that the hollow cylinder can be made from other type of metal sheet, such as the corrugated porous plate of Figure 16D.

Uchida '211 can be further applied to teach that the catalyst can be fit into a curve or a bent portion of an exhaust pipe (note Figures 16 A-B).

Uchida '211 further discloses that a support structure can be used (note Figures 5-6, item 23 and column 6, lines 15-45). This support structure is considered the same as the mounting flange as required in the instant claim 32.

For the limitation regarding the shape of the support or carrier for the catalyst member, it would have been obvious to one skill in the art at the time the invention was made to optimize the shape of the support or carrier of the catalyst member of Ishida '281 depending on the application in which the catalyst is used providing such shape would promote the purification of an exhaust gas. It would have been obvious to one skilled in the art to select a shape of a corrugated, perforated tube, as suggested by Uchida '211 because such shape is desired when catalyst is used in a motorcycle internal combustion engine.

Claims 30, 35, 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ishida '281 in view of Uchida '211 as applied to claims 1-3, 5-6, 31-34, 37-38, 40-43 above, and further in view of Donomoto (4,798,770) or Draghi et al (6,042,879).

The difference not yet discussed is Ishida '281 does not disclose that the anchor layer comprises nickel and aluminum.

However, Ishida '281 teaches that the molten metal sprayed is preferred to be the same type of material as the metal plate (note column 5, lines 9-10) and the metal plate is desired to be heat resistance and corrosion resistance (note column 4, lines 53-

61) such as stainless steel. However, the teaching of Ishida '281 should not be limited to just the exemplified metals.

Donomoto '770 discloses that alloys include Ni-Cr alloys, Ni-Al alloys containing 3-20% Al, Ni-Cr-Al alloys, Ni-Cr-Al-Y alloys are heat and corrosion resistant (note column 5, lines 51-63).

Alternatively, Draghi '879 teaches that MCrAlY, where M is nickel and/or cobalt, has corrosion and heat resistant properties (note column 4, lines 7-14). It would have been obvious to one skilled in the art to optimize the composition of the MCrAlY alloy to obtain the desired corrosion and heat resistant properties.

It would have been obvious to use any known metal that is heat and corrosion resistance, such as the MCrAlY alloys suggested by Donomoto '770 or Draghi '879 for the catalyst of Ishida '281 because heat and corrosion metal is desired in Ishida '281.

Claims 1-3, 5-6, 30-35, 37-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorynin (5,204,302) in view of Uchida '211, optionally further in view of Rondeau (4,027,367) and Ishida '281.

Gorynin '302 discloses a catalyst comprising a metallic substrate; an adhesive sublayer diffusion bonded onto said substrate; and a catalytically active layer deposited on said sublayer and a porous layer deposited on said catalytically active layer (note claim 1). The adhesive sublayer is prepared from thermally reactive powders, such as those prepared from nickel and titanium, aluminum with at least one or more of Co, Cr, Mo, Ta, Nb, Ti or Ni or silicon with at least one or more of Ti, Nb, Cr, W, Co, Mo, Ni or

Ta (note column 2, lines 25-35). For the composition of the Ni alloy used, it would have been obvious to one of ordinary skill in the art to optimize such composition to obtain the best adhesive layer. The adhesive sublayer as disclosed in Gorynin '302 is considered the same as the claimed anchor layer.

Gorynin '302 further discloses that the catalyst can be used for the purification of waste gases from an internal combustion engine (note column 1, lines 6-10). Gorynin '302 further discloses that because of the strong adhesion of the catalyst layers to the substrate, the catalyst can be corrugated and punched after deposition of the catalyst layer (note column 3, lines 57-60). This fairly teaches that the adhesive sublayer and the catalyst layer stay intact when the catalyst is bent. Furthermore, Gorynin '302 discloses the step of rolling a corrugated catalyst strip into a cylinder (note column 9, lines 64-67).

The adhesive layer in Gorynin is formed by plasma spraying. The thermally reactive powders are introduced into a plasma torch and an exothermic reaction is initiated in the torch. The exothermic powders impinge the substrate where the reaction continues. The heat generated in the reaction causes diffusion of the sub-layer into the substrate resulting in a diffusion bond and strong adhesion of the sublayer to the substrate (note column 3, lines 6-15). Thus, Gorynin '302 fairly teaches that the plasma spraying process is used to obtain a diffusion layer, which improves the bonding between the two layers.

The process limitation in claim 6 is noted. However, when the examiner has found a substantially similar product as in the applied prior art, the burden of proof is

shifted to Appellant to establish that their product is patentably distinct and not the examiner to show the same process of making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324.

Optionally Rondeau '367 is applied as stated below to teach the use of electric arc to form the adhesive layer.

Rondeau '367 discloses a method of thermal spraying a substrate to deposit a self-bonding coating on such substrate, comprising supplying an electric arc thermal spray gun with a wire feed comprising an alloy of nickel and aluminum or titanium, and using such electric arc thermal spray gun, spraying said wire feed onto such substrate to coat the same thereby to establish diffusion bond between such coating and such substrate to provide a self-bonding coating on such substrate (note claim 1). Rondeau '367 discloses that several types of thermal spraying guns are available including combustion flame spray guns, e.g., the oxy-fuel gas type, plasma arc spray guns and electric arc spray guns. Combustion flame spray guns require a source of fuel, such as acetylene, and oxygen and the temperature produced therein are usually relatively low and often incapable of spraying materials having melting points exceeding 5,000^{o}F. Plasma arc spray guns are usually the most expensive type and they produce much higher temperatures than the combustion type, e.g. up to approximately 30,000^{o}F. Furthermore, plasma arc spray gun require a source of inert gas, such as argon, for creation of the plasma, and the gas flow rate and electric power therefor require extremely accurate control for proper operation. On the other hand an electric arc spray gun simply requires a source of electric power and a supply of compressed air or other

gas, as is well known, to atomize and to propel the melted material in the arc to the substrate or target (note column 1, lines 25-43).

In undertaking the method of Rondeau '367 a number of important advantages are realized over the prior art. Firstly, the process uses an electric arc spray gun, which is more economically operated than other thermal spray equipment. Second, the material to be sprayed is supplied as a wire, which is more convenient to use than powder. The wire may be thin strand all the way up to a relatively thick rod as long as it is suitable for spraying through an electric arc spray gun. Third, the wire is readily formed as an alloy of the two primary materials nickel and aluminum or nickel and titanium. Fourth, the cohesive, adhesive and hardness attributes of the coating on an article formed by the method of the invention are generally equivalent to or better than corresponding attributes for a coating on an article sprayed with powder using other thermal spray devices (note paragraph bridging columns 2-3).

Rondeau '367 can be further applied to teach that the wire alloy comprises a minimum of 93% nickel, from 4 to 5.2% aluminum, from 0.25 to 1.00% Ti (note column 4, lines 15-20).

For the intended use limitations, note reasons as stated above.

It would have been obvious to one of ordinary skill in the art at the time of the invention was made to use electric arc spraying method, instead of plasma spraying, to form the adhesive layer in Gorynin '302, as suggested by Rondeau '367 because electric arc spraying method can form the same diffusion bond between the two layers but it would cost less plus the additional advantages as stated above.

Optionally, Ishida '281 can be applied as stated above to teach that it is known in the art to form an adhesive layer on a substrate of a catalyst by using electric arc spraying process before depositing the catalytic layer in order to form a catalyst that is highly resistant to peel off (i.e. better bonding) (note column 7, lines 62-67).

Uchida '211 is applied as stated above to teach the desired shape of the catalyst member, i.e., a hollow cylinder and the catalyst can be positioned in a curve or bent portion of an exhaust pipe or to have perforations on the surface of the hollow cylinder.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to further include perforations on the surface of the corrugated catalyst cylinder of Gorynin '302 and to put the catalyst in a curve or bent portion of an exhaust pipe by Uchida '211 because such shape and position are desirable for a catalyst used in an analogous application (both the catalysts of Gorynin '302 and Uchida '211 are used to treat exhaust gas from an internal combustion engine, thus, they are considered as analogous catalysts).

(10) Response to Argument

I. Rejection over Ishida and Uchida (Uchida '211)

Appellants argue that claims 1 and 34 have been amended to clarify that the placement of the conformable catalyst member within a bent or curved portion of an exhaust pipe is a positive limitation of the claims.

In Appellants' claims 1 and 34, the limitations of "*when* the conformable catalyst member is bent along its length and mounted within a bent or curved portion of an

exhaust pipe" and "*when* placed in a bent or curved configuration to provide intimate contact of the exhaust gas with the catalytic coating of conformable catalyst member..., the catalytic coating remains intact on the carrier" are still considered as an intended use, note the "when" language. For claim 1, the "when" limitation is taken in view of the "*to be mounted* in a curved or bent configuration" limitation, which clearly is an intended use. The claims only positive require that the catalyst member be "conformable" (i.e., can be bent) and *can be* mounted in a curve (but not actually mounted). As applied in the above rejections, the catalyst member in Ishida can be shaped into different shapes (note for example, Figures 3-4); thus the catalyst member is considered as being "conformable". The "conformable" property appears to depend on the shape of the catalyst member, i.e., whether or not the catalyst has the shape of corrugated tube or other claimed shapes, not how the catalyst member was formed. There is no evidence on record to show that if a catalyst member was formed by bending a carrier into the shape of a corrugated tube before depositing a anchor layer and a catalytic layer, it would not have the "conformable" property as compared to a catalyst member that was formed by bending into the same shape of corrugated tube but after depositing the same layers on a carrier. For both claims 1 and 34, even if the claimed catalyst member was required to be placed in a bent or curved portion of an exhaust pipe, such limitation still does not require that the catalyst member be bent because even a straight tube still can be fit into a curve if the radius of the curvature is large (i.e., the curve has less bent) and the length of the catalyst is short enough (similar to when a straight segment can fit into an arc of a circle). Furthermore, even if the claimed catalyst

member was further required to be bent in order to fit into a curved or bent configuration of an exhaust pipe, such “bent” in the claimed catalyst member, resulting from the bending action, is considered as a “product by process limitation”. However, when the examiner has found a substantially similar product as in the applied prior art, the burden of proof is shifted to Appellant to establish that their product is patentably distinct and not the examiner to show the same process of making. *In re Brown*, 173 USPQ 685 and *In re Fessmann*, 180 USPQ 324. In this case, whether the carrier in the catalyst member is bent before (such as the bending action disclosed in Ishida) or after the steps of depositing the anchor layer and the catalytic coating layer, the final catalyst member still has the same "bent" shape, the same coatings and still can fit or be mounted within a bent or curved portion of an exhaust pipe. For the limitation requiring the anchor layer and the catalytic coating on the carrier to remain intact “when” the catalyst member is bent, the actual bending is not positively required, i.e., the catalyst member is not required to be bent, however, if the catalyst member was to be bent, the coating would remain intact. For the product of Ishida ‘281, the “remains intact” property is inherent because there is an anchor layer present in the catalyst to promote bonding between the carrier and the catalytic coating, especially when such anchor layer is formed by the same electric arc spraying process as used in Appellants' claimed invention. When the examiner has reason to believe that the functional language asserted to be critical for establishing novelty in claimed subject matter may in fact be an inherent characteristic of the prior art, the burden of proof is shifted to Appellants to prove that the subject matter shown in the prior art does not possess the characteristics

relied upon. *In re Fitzgerald et al.* 205 USPQ 594. For claim 37, Uchida '211 is further applied to teach that the catalyst can be put in a bent or curved portion of an exhaust pipe (note Figure 16 A-B). Again, there is no positive requirement in Appellants' claims to bend the catalyst member or to bend the catalyst member after the deposition of the anchor layer and the catalytic coating.

Appellants cite In re Watanabe, 325 F. 2d 924 (CCPA 1963) to further argue that "when" limitation is positively required.

In Watanabe case, it appears that the electrode will *not* inherently produce an electromotive force when inserted into a solution of salt. However, for the instant case, the "remains intact" property is inherently achieved in the product of Ishida '281 because there is an anchor layer or adhesive layer used to promote the bonding between the carrier and the catalytic layer. Ishida '281 clearly teaches that the anchor layer with rough surfaces formed by electric arc method is used to prevent catalytic substance from falling off (note column 2, lines 17-20 and column 4, line 63 to column 5, line 13). The "remains intact" is an inherent property in the product of Ishida '281 or Gorynin '302 also because the product of Ishida '281 is formed by exact same electric arc spraying method as used in Appellants' claimed invention.

Appellants argue that there is no teaching or suggestion in Ishida of a catalyst member that can be bent or curved so that the catalyst member can be inserted into a bent or curved engine exhaust pipe.

As stated above, Appellants' claims, while requiring the carrier having the shape of a tube of corrugated construction, do not positively require the step of bending the

catalyst member (i.e. after the deposition of the anchor layer and the catalytic coating on the carrier) nor the step of inserting the catalyst member into a bent or curved portion of an exhaust pipe. Ishida '281 does disclose that the metal plate, i.e. the carrier for the catalyst member, is "conformable" and can be bent (note column 3, lines 61-68). This fairly suggests that the metal plate as disclosed in Ishida '281 can be formed into a tube of corrugated construction as suggested by Uchida '211.

Appellants argue that although the bare metal plate can be bended, there is indication that the catalyst unit is designed or intended to be bent.

This argument is not persuasive for the same reasons as stated above. Again, Appellants' claims only require a catalyst member comprising a tube of corrugated construction "to be mounted in a curved or bent configuration along its length within a bent or curved portion of an exhaust pipe", not positive require that the catalyst "unit" or member (i.e., after the anchor layer and the catalytic layer are deposited on the carrier) be bent. Even if Appellants' claims required a bent in the catalyst member, there is no difference in structure seen between a catalyst which is formed by bending the carrier before depositing the anchor layer and the catalytic layer and a catalyst which formed by bending after depositing the same layers. Again, Appellants' claims are to a product, note In re Fessmann, In re Brown as stated above.

Appellants argue that Ishida describes, at column 2, lines 5-14, problems associated with prior art catalyst units, including the falling off of catalytic substances from metal plates or wire mesh subjected to even slight deformation.

The problems as mentioned in Ishida are for the prior art, not for the invention of Ishida '281. Ishida '281 solves the above mentioned problems by providing a layer with rough surfaces on the carrier to promote bonding between the carrier and the catalytic layer (note Figures 17, and column 4, line 62 to column 5, lines 13).

Appellants argue that Ishida further teaches at column 4, lines 47-52, that the thickness of the metal plate is preferably thin, but toughness of the metal plate is required in order not to easily yield to deformation and this teaches away from the "conformable" catalyst member bendable along its length for mounting within a bent or curved portion of an exhaust pipe recited in the instant claims.

It should be noted that when a metal plate has “toughness”, it does not mean that such metal plate is not flexible or cannot be bent. As cited and discussed in the Final office action (mailed August 29, 2006), Dean et al (2001/0006008) (note paragraph [0022]), Tormala et al (6,221,075) (note column 1, lines 60-67) and Grothues-Spork et al (5,713,906) (note column 2, lines 10-12) show that a metal plate or strip, such as stainless steel metal, can be "tough" and "flexible" or "ductile" at the same time. Furthermore, in Ishida '281, the disclosure of “not to easily yield to deformation” fairly suggests that accidental changing in shape (as in “deformation”) is undesirable, however, the metal plate can intentionally be bent to any desired shape as shown in the Figures, such as Figures 3-4. In any event, for the combined teaching Ishida '281 and Uchida '211, the catalyst member in Ishida '281 would have the shape of a corrugated tube as suggested by Uchida '211, and such catalyst member would inherently be “conformable” as the claimed product.

Appellants argue that Uchida '211 does not disclose that the exhaust purifiers (i.e. the catalyst members) are placed in the curved portions of the exhaust purifying apparatuses (i.e. exhaust pipes).

Granted that in Figure 12, the exhaust purifiers are placed in the straight portion of the exhaust pipes as argued by Appellants, however, Uchida '211 also shown in Figures 6, 16A and 16B that the exhaust purifiers can be placed in the "curved" portion of the exhaust pipe. Except for claims 37-43, Appellants' claims do not positively require that the catalyst member be mounted within the bent or curved portion of the exhaust pipe. For claims 37-43, as required in claim 37, the catalyst member "is disposed within a bent or curved portion of an exhaust pipe having an open discharge end", the circular cross section of the exhaust pipe can be considered as the claimed "curved portion", thus, when the catalyst of the combined teaching (note the above rejections) has the shape of a tube, which also has a circular cross section, the circular cross section of the catalyst tube is considered as being placed or fit into the "curved" circular cross section of the exhaust pipe (similar to concentric pipes).

Appellants argue that any evidence of obviousness in view of Ishida and Uchida has been successfully rebutted by the data submitted in paragraphs 5-10 and Exhibit A of the Galligan Declaration.

In the Declaration and Exhibit A, the performance of a Flextube in 4-stroke motorcycle exhaust system is compared to the performance of a rigid tube in the same system, however, there is no sufficient evidence on record to equate the "Flextube" to the claimed catalyst member as now required in Appellants' claims and the rigid tube to

the catalyst member as disclosed in Ishida '281 (or in Gorynin '302). For the "Flextube", there is no disclosure that such tube has the same "corrugated" or "plurality of perforated plate members having opposite faces and disposed in a face-to face linear array to impart a cylindrical shape" as required in Appellants' claims 1 and 34, respectively and there is no disclosure of the intermediate anchor layer for the "Flextube". For the "rigid tube", even if in the disclosure of Ishida '281, the catalyst member (after depositing the anchor layer and the catalytic layer on the carrier) was not bent, it does not in any way automatically teach that the catalyst cannot be bent or is rigid. Since the carrier layer can be bent before the deposition of the layers, and the anchor layer is of the same material as the carrier layer (i.e. having the same ductility) and the thicknesses of the anchor layer and catalytic layer are relatively thin as compared to the carrier, one skilled would reasonably expect that the catalyst can still be bent after the deposition of the layers (in Gorynin '302, the catalyst strip is corrugated and rolled into a cylinder, note column 9, lines 64-68, this fairly teaches that the catalyst is not rigid). Thus, the showing in the Declaration and Exhibit A is not persuasive because the claimed invention was not compared to the closest prior art, which is the bendable catalyst as disclosed in Ishida '281 (or in Gorynin '302). Section 716.02(b) of the MPEP states that "evidence of unexpected properties may be in the form of a direct or indirect comparison of the claimed invention with the closest prior art which is commensurate in scope with the claims. See In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) and MPEP §716.02(d) - § 716.02(e). See In re Blondel, 499 F.2d 1311, 1317, 182 USPQ 294, 298 (CCPA 1974) and In re Fouche, 439 F.2d 1237, 1241-

42, 169 USPQ 429, 433 (CCPA 1971) for examples of cases where indirect comparative testing was found sufficient to rebut a prima facie case of obviousness. The Declaration is not persuasive especially for claims 34 and 35 because any unexpected results cannot be extrapolated or expected for other conditions, note item 10 of the Declaration which states "I *expect* that a catalyst member having the configuration as recited in claims 34-35 *would produce similar results* since they are bendable and able to be inserted into the curved or bent portion of an exhaust pipe". The Declaration and Exhibit is also not persuasive because the alleged unexpected results as shown is not commensurate in scope with Appellants' claims, as Appellants' claims are drawn to a catalyst product, which can be used in various other applications beside the process of treating exhaust gas for motorcycle engine as used in the Declaration, such as treating exhaust gas from a power plant or a boiler.

Claim 5

For claim 5, Appellants argue that the claim requires that the tube of corrugated construction comprises alternating rings separated by annular webs.

In both Ishida '281 and Uchida '211, corrugated structure is disclosed. By nature, corrugated structure has alternating "hills" and "valleys". The hills are considered as the claimed "rings" and the valleys are considered as the claimed "annular webs".

Claim 34

Appellants argue that claim 34 requires a plurality of perforated plate members having opposite faces and disposed in a face-to-face linear array to impart a cylindrical

shape having a length to the carrier and to form accordion pleats as shown in Figures 6-7.

Ishida '281 fairly discloses a catalyst having the accordion pleats (note Figure 4), and Uchida '211 is applied to suggest using include perforations on such catalyst and to use such catalyst to impart a cylindrical shape.

Claims 31 and 40

For claims 31 and 40, Appellants argue that the claims require that the carrier has a distal end and a proximal end, the proximal end comprising a mounting member dimensioned and configured to be secured to the open discharge end of the pipe when the body portion of the carrier is disposed within the pipe.

Again, the "when" limitation is considered as an intended use. In any event, as required in Applicants' claims 31 and 40, the carrier is secured to the "open discharged end of the pipe", i.e. closer to the discharged end then the inlet end and in Uchida '211, the hollow tube as shown in Figures 2, 3, 5, 6, 9A-E, etc., has an *elongated* portion, which considered as having a "distal end" and a "proximal end", and a support member (note Figures 5-6, item 23 or 26).

Appellants further argue that in Figures 5, 6, the structure is mounted inside the pipe and not on the open end of the pipe.

As shown in Figures 5, 6, a mounting member is used to hold the catalyst member in place and as shown in Figures 16A-16B, the catalyst member can be positioned toward the discharge end of the pipe. It would have been obvious to one

skilled in the art to select an appropriate location for the mounting member as long as it can hold the catalyst member in place.

Claims 32 and 41

For claims 32 and 41, Appellants argue that the claims recite the annular collar as defining a mounting flange disposed radially outwardly of the proximal end of the catalyst member.

The support member, item 23 as shown in Figures 5-6 of Uchida '211, is considered the same as the claimed mounting flange. Varying in design choices for the support member would have been obvious to one of ordinary skill in the art, In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966) (The court held that the configuration of the claimed disposable plastic nursing container was a matter of choice which a person of ordinary skill in the art would have found obvious absent persuasive evidence that the particular configuration of the claimed container was significant.).

Claims 42

Appellants argue that claim 42 is directed to a catalytic assembly comprising the conformable member of claim 1 disposed within a bent or curved portion of an exhaust pipe requires that the carrier tube comprises a plurality of perforations around the periphery of the carrier tube.

Uchida '211 is applied as stated above to teach that a perforated tube can be used as the carrier for the exhaust purifier (note for example Figures 3, 12, column 4, line 56 to column 5, line 20). Such perforated tube is considered as having the claimed "perforations around the periphery of the carrier tube".

Claim 43

Appellants argue that claim 43 recited a plurality of interior closures to prevent passage of exhaust therethrough and force passage of the exhaust out through the perforations of the carrier tube and wherein the exhaust pipe comprises a series of interior annular baffles.

As shown in Figures 11A, the upstream end portion of the catalyst member (22) is closed by a flat cap 28 (note column 10, lines 21-23). This cap is considered as one of the claimed "interior closures" and the partition plate 27 is considered as one of the claimed baffle. Also as shown in Figures 11A, the flow of the exhaust gas is desired to pass through the perforations of the catalyst member (note black arrows), thus, it would have been obvious to one of ordinary skill in the art to include more than one cap and more than one partition plate to achieve additional effects.

II. Rejection over Ishida, Uchida and Donomoto or Draghi

Appellants argue that where an independent claim is valid over cited art, a fortiori any claim dependent therefrom must also be valid over the same art and the Examiner has failed to point to anything in Donomoto or Draghi that remedies the deficiencies of Ishida and Uchida regarding conformability.

Donomoto or Draghi is only applied to teach a Ni-Al bonding layer. The above argument is not persuasive for the same reasons as stated above.

III. Rejection over Gorynin, Uchida, Rondeau and Ishida

Appellants argue that "neither *Ishida* nor Uchida teaches or suggests a catalyst member that can conform to the bend or curve along its length in an exhaust pipe, or that any catalytic coating thereon would remain intact upon bending or curving along its length".

It is assumed that “Ishida” as mentioned in the argument above is intended to be Gorynin '302. For the catalyst of Gorynin, the catalyst of NiAl sublayer, gamma-alumina catalytically active layer and a porous layer was assembled by corrugating a catalyst strip and rolling it into a cylinder (note column 9, lines 64-68), this fairly teaches that the catalyst (after the anchor layer and the catalytic layer had been deposited on the carrier) is corrugated and rolled into a tube; therefore, the catalyst of Gorynin '302 must be as “conformable” as the claimed product because it has the same "tube of corrugated construction", same anchor layer as required in Appellants’ claim 1. The “remain intact” property would also inherently achieved in the product of Gorynin especially when Gorynin '302 discloses that because of the strong adhesion of the catalyst layers to the substrate, the catalyst can be corrugated and punched after deposition of the catalyst layers (note column 3, lines 55-60).

Appellants argue that the rejection based on the cited reference fails to establish that it would have been prima facie obvious to provide a catalyst member that can be mounted in a curved or bent configuration along its length within a bent or curved portion of an exhaust pipe.

The limitations “to be mounted” and "when the conformable catalyst is bent along its length" are considered as intended use limitations, note the reasons as stated in the above rejection.

Appellants further argue that the dimensions of the corrugated catalyst strip would hardly provide a catalyst member that can be mounted in curved or bent configuration along its length within a bent or curved portion of an exhaust pipe.

There is no requirement for size for the catalyst member and the “to be mounted" is only an intended used. The diameter of 20-50 mm as disclosed in the Gorynin ‘302 is comparable to the OD of 22-34 mm used in Exhibit A (note page 3, first full paragraph). For the length, even if the length of the catalyst member as disclosed in Gorynin ‘302 could not be optimized, Appellants have not provided any evidence that it could not be mounted in curved or bent configuration especially then Appellants' claims do not require that the catalyst member goes on for the entire curved or bent configuration.

The rejection of all claims, including the dependent claims, over Gorynin in view of the secondary references is maintained for the same reasons as stated above.

(11) Related Proceeding(s) Appendix

Copies of the court or Board decision(s) identified in the Related Appeals and Interferences section of this examiner’s answer are provided herein.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

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